

ABSTRACT OF THE INVENTION

An electro-mechanical battery having an annular rotor structure with magnetic levitation components integrally mounted in the rotor structure providing a passive levitation system in conjunction with a central core having permanent magnet elements mounted thereon, eliminating the need for the shaft and hub typically used on such devices. The rotor structure and central core are disposed in an evacuated housing. The rotor comprises a composite core wrapped with one or more layers of high-strength composite filaments, wherein the first layer is wrapped over the composite core in a continuous filament spiral-wound pattern, the second layer is wound in the same pattern, but in a counter-rotating direction and the third layer is wound in sequential planes radial to the axis of the rotor. Preferably, the closed-circuit conductive coils are embedded in the rotor structure and the magnet elements are configured in a Halbach Array.